

REMARKS

The specification has been amended to correct a typographical-type matter. Claims 1, 8, 21 and 30 have been amended, and claims 11-20 have been cancelled without prejudice. No new matter has been added.

The specification and claims have been amended to overcome the non-substantive objections noted pages 2 and 3 of the Office Action.

Claims 1-31 were rejected under 35 U.S.C. 112, first paragraph.

While Applicants disagree with the rejection, it is believed that independent claims 1 and 21 (the only pending independent claims) as amended herein obviate the rejection. Withdrawal of the rejection is requested.

Claims 11-16, 18, 20, 21, 27, 28, 30 and 31 were rejected under 35 U.S.C. 102(e) over Melzer (U.S. 6,547,946) "with evidence of physical properties provided by CRC Handbook of Chemistry and Physics".

While Applicants disagree with the rejection, the rejection has been obviated by the amendments made herein. Claims 11-20 have been cancelled without prejudice. Independent claim 21 has been amended to recite features of claims 22-24, which were not subject to the present rejection.

In view thereof, reconsideration and withdrawal of the rejection are requested.

Claims 21, 25-27, 29 and 31 were rejected under 35 U.S.C. 102(b) over Cohen (U.S. Patent 4,923,574).

While Applicants also disagree with this rejection, it is also believed the rejection has been obviated. Independent claim 21 has been amended to recite features of claims 22-24, which were not subject to the present rejection. Withdrawal of the rejection is requested.

Claims 1-10 and 22-24 were rejected under 35 U.S.C. 103 over Melzer (U.S. 6,547,946) in view of Akram et al. (U.S. Patent 5,893,966) "with evidence of physical properties provided by CRC Handbook of Chemistry and Physics".

In the Office Action, it is apparently acknowledged that the Melzer document does not disclose plating on the substrates recited in the pending claims. However, the position is taken than Akram reports certain electrodepositing on semiconductor components and therefore it would have been obvious to utilize the procedure reported in the Melzer document on semiconductor components.

The rejection is traversed.

The entire thrust of the Melzer document is to treatment of printed circuit boards. Nowhere does Melzer provide any suggestion that the reported methods could be used to treat any other type of substrate. Indeed, Melzer only reports plating of copper and nickel as specifically used for printed circuit board manufacture.

This difference is significant. Persons skilled in the art recognize that plating copper and other metals on a semiconductor wafer or other semiconductor substrate is considerably more difficult, and poses unique issues relative to plating on a printed circuit board.

This is made clear in, for instance, U.S. Patent 6,290,833, copy enclosed. Thus, at column 2, lines 35-39 of U.S. Patent 6,290,833, the following is reported (bold emphasis added):

Despite the advantageous properties of **copper**, **it has not been as widely used as an interconnect material as one would expect. This is due, at least in part, to the difficulty of depositing copper metallization** and, further, due to the need for the presence of barrier layer materials.

U.S. Patent 6,297,154, copy enclosed, reports the following at column 2, lines 33-39 (bold emphasis added):

As noted in U.S. Pat. No. 5,627,102 to Shinriki et al., one problem associated with the formation of metal interconnects is that voids form in the metal filling of the recess. Such faulty fill-up leads to a failure to establish a sound electrical contact.

U.S. Patent 6,171,960, copy enclosed, reports the following at column 1, lines 10-27 (bold emphasis added):

The fabrication of deep submicron ultra large scale integrated (ULSI) circuits requires long interconnects having small contacts and small cross-sections.

* * * *

Many problems, however, are encountered in fabricating circuit interconnects with copper. Some of the major difficulties include: (1) copper oxidizes at low temperatures; (2) copper has poor adhesion to substrates; (3) copper diffuses into silicon dioxide and other dielectric materials used in micro-circuitry; and (4) copper requires a high temperature for patterning by reactive ion etching.

In view thereof, reconsideration and withdrawal of the rejection are requested.

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Claims 17 and 19 were rejected under 35 U.S.C. 103 over Melzer (U.S. 6,547,946)
"with evidence of physical properties provided by CRC Handbook of Chemistry and Physics
....".

Claims 17 and 19 have been cancelled without prejudice. Withdrawal of the rejection is
requested.

It is believed the present application is in condition for immediate allowance, which
action is earnestly solicited.

Respectfully submitted,



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